SSM-525US

Appln. No.: 10/788,910

Amendment Dated March 29, 2006

Reply to Office Action of December 29, 2005

<u>Amendments to the Claims:</u> This listing of claims will replace all prior versions, and listings, of claims in the application

## **Listing of Claims:**

- (Previously Presented) A storage device for withdrawing interlocked bulk goods, comprising:
  - a) a storage container;
  - b) a feeding device for filling said storage container with said bulk goods;
  - c) and spiked shafts arranged in the storage container which are rotary driven about their rotational axes and mate with each other in order to convey the bulk goods to be withdrawn from the storage container in a conveying direction perpendicular to their rotational axes;
  - d) wherein said spiked shafts are arranged such that they engage with the bulk goods in order to withdraw them from above.
- 2. (Previously Presented) The storage device as set forth in claim 1, further comprising a withdrawing means protruding in terms of height through a column of bulk goods formed in the storage container as far as a central region of a free upper surface of said column of bulk goods, and wherein the conveying direction of the spiked shafts points from a periphery of the column of bulk goods, along a free upper surface, to said withdrawing means.
- 3. (Previously Presented) The storage device as set forth in claim 2, wherein the withdrawing means is arranged in the conveying direction of the spiked shafts and is a fall-pipe into which the spiked shafts convey the bulk goods.
- 4. (Currently Amended) The storage device as set forth in the preceding claim 3, wherein the fall-pipe can be changed in length, in order to adjust its height to a height of the column of bulk goods accommodated in the storage container.
- 5. (Currently Amended) The storage device as set forth in the preceding claim 4, wherein the fall-pipe comprises pipe segments which can be axially slid into each other and

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which slave each other when the fall-pipe is shortened, such that a telescopic pipe is formed.

- 6. (Previously Presented) The storage device as set forth in claim 2, wherein the spiked shafts are arranged in the storage container such that they can be lowered and the withdrawing means can be changed in length, in order to shorten it when the spiked shafts are lowered.
- 7. (Currently Amended) The storage device as set forth in the preceding claim 6, wherein the spiked shafts are mounted in a frame which can be lowered, such that they can be rotated about their rotational axes, and wherein said one end of the withdrawing means which forms an upper opening of the withdrawing means through which the spiked shafts convey the bulk goods into the withdrawing means, said one end is connected to said frame, such that when the frame is lowered, it slaves said end of the withdrawing means, in order to shorten the withdrawing means.
- 8. (Previously Presented) The storage device as set forth in claim 2, wherein a withdrawing conveyor is arranged beneath the withdrawing means, in order to withdraw the bulk goods.
- 9. (Previously Presented The storage device as set forth in claim 1, wherein the spiked shafts are mounted in a frame such that they can rotate about their rotational axes and said frame is arranged in the storage container such that it can be lowered and raised.
- 10. (Currently Amended) The storage device as set forth in the preceding claim 9, wherein the frame comprises a lowering and rising frame and a pivoting frame which can be jointly lowered and raised, and wherein said lowering and rising frame mounts said pivoting frame such that it can be pivoted about a pivoting axis and the pivoting frame mounts the spiked shafts such that they can be rotated about their rotational axes.
- 11. (Currently Amended) The storage device as set forth in the preceding claim 10, wherein a support for the lowering and rising frame is mounted to the storage container such that it cannot rotate about the pivoting axis, in order to absorb a reaction moment necessary for the pivoting movement of the pivoting frame.

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12. (Currently Amended) The storage device as set forth in the preceding-claim\_11, wherein the support, secured against rotation by the lowering and rising frame, is formed by at least one guiding cam extending in the direction of the lowering and rising movement of the lowering and rising frame and at least one engaging element guided along said guiding cam.

- 13. (Previously Presented) The storage device as set forth in claim 9, further comprising a lowering and rising drive having at least one motor which is coupled to the frame, in order to lower the frame for withdrawing the bulk goods and to raise the frame for filling the storage container.
- 14. (Currently Amended) The storage device as set forth in the preceding claim 13, wherein said lowering and rising drive is a winch drive.
- 15. (Currently Amended) The storage device as set forth in claim 13, wherein the lowering and rising drive comprises a regulator or a controller for said at least one motor and at least one distance sensor which detects a vertical distance between a the frame, which further mounts the spiked shafts and the bulk goods, and wherein said distance is fed to said regulator as a regulating variable or to said controller as a controlling variable, to form a manipulated variable for the at least one motor.
- 16. (Previously Presented) The storage device as set forth in claim 1, wherein a rate at which the spiked shafts are lowered for withdrawing the bulk goods is set in accordance with a plunging depth of the spiked shafts into the bulk goods, as determined by measurement.
- 17. (Previously Presented) A storage facility comprising

at least two storage devices, each storage device comprising:

- a) a storage container,
- b) a feeding device for filling said storage container with said bulk goods,
- and spiked shafts arranged in the storage container which are rotary
  driven about their rotational axes and mate with each other in order to

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convey the bulk goods to be withdrawn from the storage container in a conveying direction perpendicular to their rotational axes, and

 wherein said spiked shafts are arranged such that they engage with the bulk goods in order to withdraw them from above;

wherein the at least two storage devices are connected to each other by a common feeding device and/or a common withdrawing conveyor, in order to be able to alternately fill and empty the storage container of one storage device and the container of the at least one other storage device.

- 18. (Previously Presented) A storage device for interlocking bulk goods, comprising:
  - a) a storage container;
  - b) a feeding device for filling said storage container with said bulk goods;
  - a withdrawing means which protrudes in terms of height through a column of bulk goods formed in the storage container as far as a central region of a free upper surface of said column of bulk goods;
  - d) and a rake conveyor arranged in the storage container, comprising a traction means and rakes drawn by said traction means which engage with the bulk goods on said free upper surface of the column of bulk goods, in order to convey the bulk goods, on its own or together with a conveyor of a different design, in a conveying direction from the periphery of the surface of the column of bulk goods to said withdrawing means.
- 19. (Currently Amended) A method for withdrawing interlocked bulk goods from a storage container comprising the steps of:, wherein
  - <u>providing</u> a carrying-off means <u>arranged</u>-in said storage container, <u>said carrying-off</u> <u>means comprising and formed by spiked shafts or/and at least one rake conveyor;</u>
  - engages engaging said carrying-off means in said storage container with the column of bulk goods on a free upper surface of a column of bulk goods formed in the said storage container from the bulk goods; and

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conveys-conveying said bulk goods along said <u>free upper</u> surface to a withdrawing means which transfers the bulk goods downwards onto a withdrawing conveyor.

- 20. (Currently Amended) The method as set forth in the preceding claim 19, wherein the bulk goods fall through the withdrawing means.
- 21. (Currently Amended) The method as set forth in claim 19, wherein the withdrawing means protrudes in terms of height through the column of bulk goods as far as a central region of its free upper surface, such that the bulk goods on the said free upper surface of the column of bulk goods are only conveyed into the central region from a periphery of the said free upper surface.
- 22. (Previously Presented) The storage device as set forth in claim 2, wherein the withdrawing means is formed by a fall-pipe.
- 23. (Previously Presented) The storage device as set forth in claim 5, wherein said axially movable pipe segments also slave each other when the fall-pipe is extended.
- 24. (Previously Presented) The storage device as set forth in claim 12, wherein the guiding cam is connected to a side wall of the storage container such that-it\_said\_guiding\_cam cannot rotate about the pivoting axis.
- 25. (Previously Presented) The storage device as set forth in claim 12, wherein said engaging element is connected to the lowering and rising frame such that it said engaging element cannot rotate about the pivoting axis.
- 26. (Previously Presented) The method as set forth in claim 19, wherein said withdrawing means is a vertical conveying means.
- 27. (New) A method for withdrawing interlocked bulk goods from a storage container comprising the steps of: .
  - providing a carrying-off means in said storage container, said carrying-off means comprising spiked shafts and at least one rake conveyor;
  - engaging said carrying-off means in said storage container with a free upper surface of a column of bulk goods formed in said storage container;

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conveying said bulk goods along said free upper surface to a withdrawing means which transfers the bulk goods downwards onto a withdrawing conveyor.